Public Health
Seattle & King County Fact Sheet

Tularemia: Information for Health Care Providers

❑ Epidemiology

- ✓ The natural reservoirs for *Francisella tularensis*, the causative agent of tularemia, are small and medium-sized mammals, including rabbits, hares, squirrels, and rodents.
- ✓ Humans, other mammalian species (e.g., cats, dogs, cattle), and some species of birds, fish, and amphibians are incidental hosts.
  - ♦ Infection results from
    - ▪ the bite of infective arthropod vectors (e.g., tick, mosquitoes, biting flies).
    - ▪ handling infectious animal tissues or fluids.
    - ▪ direct contact with or ingestion of contaminated water, food, or soil.
    - ▪ inhalation of infectious aerosols.
  - ♦ The infectious dose is low: Inhalation of 10 to 50 organisms can produce disease.
- ✓ Disease occurs naturally in the south-central and western United States and northern and central Europe.
  - ♦ Most infections occur in rural areas during the summer.
  - ♦ Cases in the winter can occur in hunters, trappers, and butchers.
- ✓ There is no known person-to-person transmission.

Tularemia and Bioterrorism

- ✓ Aerosolization is thought to be the most likely mode of dissemination of *F. tularensis* in a biological attack.
- ✓ Pneumonic, oculoglandular, glandular, ulceroglandular and oropharyngeal tularemia are possible clinical presentations.

❑ Microbiology

- ✓ *F. tularensis* is a small, non-motile, non-spore-forming, pleomorphic, aerobic, gram-negative coccobacillus.
- ✓ There are two major subspecies or biovars:
  - ♦ Type A, responsible for most cases in North America, is highly infectious and virulent.
  - ♦ Type B, prevalent in Europe and Asia, causes milder disease.
- ✓ F. tularensis is resistant to freezing temperatures but sensitive to heat and disinfectants.

❑ Clinical Presentation

- ✓ The incubation period is two to 10 days (range, one to 14 days).
- ✓ Non-specific, constitutional symptoms can occur with any form of tularemia: fever, chills, malaise, fatigue, myalgia, arthralgia, headache, sore throat.
- ✓ Case-fatality rate is less than 5% with treatment.

Ulceroglandular Tularemia

- ✓ Is the most common naturally occurring form (75-85% of cases) of tularemia.
- ✓ A tender erythematous papule develops at the site of inoculation before, or concurrent with, constitutional symptoms.
- ✓ The papule enlarges over 48 hours to 1-2 cm, becoming a tender, indurated, vesiculated lesion that subsequently ulcerates and may or may not develop an eschar.
- ✓ Tender regional lymphadenopathy accompanies the lesion.
- ✓ Other skin lesions (e.g., erythema nodosum, maculopapular rash, urticaria) may also be noted.

Glandular Tularemia presents the same as ulceroglandular but without an ulcer.

Pneumonic Tularemia

- ✓ Can be primary due to inhalation of infectious particles or secondary to hemotogenous spread.
- ✓ Characterized by an abrupt onset of constitutional and respiratory symptoms, including a non- to slightly productive cough, pleural chest pain, and dyspnea.
- ✓ Nausea, vomiting, and diarrhea may occur.
- ✓ Illness may be rapidly progressive and severe or may be indolent with progressive weakness and weight loss over several weeks to months.
- ✓ Lung abscesses, empyema, fibrosis, granulomatous pleuritis, ARDS, sepsis, meningitis, and pericarditis are possible complications.

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Oculoglandular Tularemia

- ✓ After direct contamination of the eye, superficial ulceration of the conjunctiva may develop along with granulomatous nodules over time.
- ✓ Chemosis, vasculitis, and regional lymphadenitis can occur.
- ✓ Organisms spread from the conjunctiva to the preauricular, submandibular, or cervical lymph nodes where focal necrosis may occur.

Oropharyngeal Tularemia

- ✓ In addition to constitutional symptoms, presenting features include exudative pharyngitis or tonsillitis, ulceration of the pharynx, tonsils, or soft palate, or stomatitis.
- ✓ A pharyngeal membrane suggestive of diphtheria may develop, but unlike diphtheria, the membrane does not bleed when removed.
- ✓ Cervical or retropharyngeal adenopathy may develop.

Typhoidal Tularemia

- ✓ Presents as a febrile systemic illness without anatomic localization of infection.
- ✓ Constitutional symptoms, watery, non-bloody diarrhea, vomiting, and abdominal pain may be prominent.
- ✓ Sepsis, rhabdomyolysis, renal failure, secondary pneumonia, and involvment of other organs via hematogenous spread are potential complications.

❑ Diagnosis

- ✓ Diagnostic tests include Gram stain, immunohistochemical stain, and culture of secretions, exudates, biopsy specimens, or blood.
- ✓ Rapid diagnostic tests include direct fluorescent antibody stain, PCR, and antigen detection, and are performed by designated public health labs.
- ✓ The lab should be notified at the time of specimen submission that tularemia is suspected.
- ✓ Chest radiograph findings in pneumonic tularemia may be minimal early in disease, progressing to peribronchial infiltrates, pleural effusions, hilar lymphadenopathy, and bronchopneumonia; cavitations and cardiomegaly may also develop.
- ✓ White blood cells, hepatic enzymes, and bilirubin may be elevated.

❑ Infection Control

- ✓ Person-to-person transmission has not been documented; standard precautions are adequate.

❑ Treatment

- ✓ Streptomycin and gentamicin are considered the first-line therapies and should be given for 10 days.
- ✓ Refer to http://www.bt.cdc.gov for current treatment and prophylaxis guidelines

❑ Prophylaxis

- ✓ In the setting of a biological attack, antibiotic prophylaxis with ciprofloxacin or doxycycline may be recommeded for those with a suspected or known exposure to *F. tularensis*, as determined by public health officials, for 14 days post-exposure.

❑ Web Resources

- ✓ Centers for Disease Control and Prevention: http://www.bt.cdc.gov
- ✓ Public Health – Seattle & King County: http://www.metrokc.gov
- ✓ Infectious Disease Society of America: http://www.idsociety.org
- ✓ Bioterrorism preparedness training modules: http://healthlinks.washington.edu/nwcphp/bttrain/
- ✓ Washington Department of Health: http://www.doh.wa.gov

Report all suspected cases of tularemia immediately to Public Health – Seattle & King County by calling (206) 296- 4774.

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